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Operating instructions

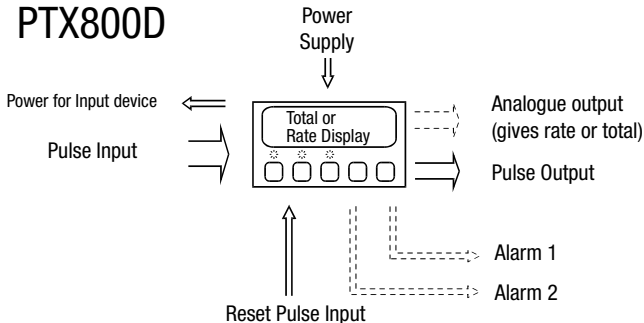
Counter and totaliser with auxiliary
functions and threshold monitoring



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PTX800D



• Operation

General

The PTX800D is a scalable pulse counter/rate indicator for digital pulse signals. It will display either the rate or total according to setup. The other value is displayed when you hold down the **TOTAL/RATE** key.

For more complex applications, the PTX800D can be supplied with two alarm channels and/or an analogue retransmit output.

Alarm conditions are indicated by the LEDs above buttons marked **AL1** (for alarm channel one) and **AL2** (for alarm channel two).

Manually clearing tripped alarms

The alarm channels can be set for automatic or manual reset. For manual reset, the LED will flash when an alarm trips. These alarms will only clear if you have acknowledged the alarm and the trip condition has cleared. Press **AL1** or **AL2** to acknowledge the alarm.

Viewing the alarm setpoints

Press the **AL1** or **AL2** at any time to display the setpoint for that channel. The value will be shown for 5 s. If the alarms are disabled, pressing the key will have no effect.

Changing the alarm setpoints

Press **PGM** while the setpoint is on display (see above), you will be able to change the value using the ▲ and ▼ keys. To save the changes, press **PGM**. Note: you can disable this feature during setup for greater security.

Checking the Rate/Total

You can set up the PTX800D to show either total or rate. If the total is normally on display, you can check the rate by holding down the **TOTAL/RATE** key.

Resetting the total

If you press the RESET key, the PTX800D will set the total to zero and clear any total alarms (you can disable this feature during setup for greater security). There is also an external reset input that you can use to clear the total remotely.

Reviewing the setup options

To review the setup (in read only mode) press the **PGM** key. The PTX800D will show the software version number. Press the ▼ key to see the next setting. The information in review mode is shown in the same order as setup mode (some irrelevant items will be skipped).

There is a 10 s timeout during review mode or you can press **PGM** again to return the display to normal operation.

You can review the setup while the instrument is in service - the unit will continue to operate normally. Setup mode

Changing the setup options

You should only use setup mode if you have to change a setting or calibrate the outputs. The setup mode stops all operation. As soon as you have setup the last parameter, the unit behaves as if it has been switched on with the new settings. This does not mean that the total is reset - you must do this yourself if necessary.

If you want to abandon all the changes you have made, simply remove the security link (or remove the power) before the **SAFE** message is shown.

To change the instrument setup:

1. Connect the security link (short pins 8 & 12).
2. Press the **PGM** key.

The setup sequence is shown in the table on page two.

• Setup options

General

There are four basic areas of the instrument operation that must be setup on a fully configured PTX800D. They are:

- Pulse/frequency inputs;
- Display and keypad operation;
- Alarms one and two (optional); and
- Analogue outputs (optional).

You can disable the alarms and/or analogue outputs if you do not need them (so that their settings are skipped).

Software version

The information in this guide refers to versions 1.00 to 1.09.

Model

PTX series instruments all look identical from the front so this identifies the instrument type.

Input signal type

Sets the input trigger and reset levels to suit the pulse source. The table below gives the threshold values.

For contact closure inputs, the software incorporates debouncing (minimum pulse width 20 mS / maximum frequency 10 Hz).

Input type	Low voltage inputs		High voltage inputs		Description
	Trigger	Reset	Trigger	Reset	
<i>L O A C</i>	50 mV	-50 mV	200 mV	-400 mV	Low level AC signals
<i>H I A C</i>	2.5 V	-2.5 V	14 V	-10 V	High level AC signals
<i>L O d C</i>	3.5 V	0.5 V	20 V	-2 V	Low level DC signals
<i>H I d C</i>	6 V	3 V	35 V	10 V	High level DC signals
<i>C o n</i>	6 V	3 V	35 V	10 V	Contact closure

Pulse rate

Set the pulse rate to low if the maximum input frequency is below 1 kHz. Otherwise it should be set to high.

Pulse scaling factor

Sets the number of pulses received for a unit change in the total. So, if you have a flowmeter that gives four pulses per litre, you can show the total in litres by setting the pulse scaling factor to four, or in kilolitres by setting the pulse scaling factor to four thousand. You can not set it to more than 10 000 display digits (i.e., ignoring the decimal point).

Total decimal point

The total decimal point position sets the number of decimal places for the total display. Totals are displayed using the full eight digits.

Rate decimal point

Sets the number of decimal places for the rate display. Rates are displayed as five digit numbers.

Rate scaling factor

The rate scaling factor sets the ratio between the total display and the rate display. It must be a power of ten (i.e., 1000, 100, ..., 0.01, or 0.001).

Number of samples

The PTX800D calculates the rate every 260 mS. The analogue output and display are then updated from the average over the programmed number of samples. For example, if you set the number of samples to 10, the analogue output and rate display will be updated every 2.6 s.

Rate timebase

The rate timebase setting sets the timebase for the rate display. It can be set to hours, minutes or seconds.

Show rate or total

Use the display rate/total setting to choose the measurement that will normally be on display.

Enable Reset key

The front panel reset key can be used to reset the total. You can disable this feature (for added security) using this setting.

Alarms disable/enable

If you do not need alarms, you can disable them. This simplifies the setup process, as all of the parameters related to the alarm operation are skipped.

Alarm type

Each alarm channel can monitor the total or the rate. Total alarms operate when the setpoint is exceeded. A 'total' alarm trip condition clears when the total is reset.

Setpoint

The setpoint is the display value at which an alarm activates. It can be changed during normal operation if the setpoint security option is off.

Alarm action

High alarms are active above the setpoint and low alarms are active below the setpoint. Total alarms are always 'high' type, so this setting is not shown.

Deadband

This parameter sets the “hysteresis” for an alarm channel; the alarm will clear above or below the setpoint to prevent chatter when the rate level passes the setpoint. The minimum deadband is one display count. Total alarms do not need a deadband setting.

Alarm output energisation options

There are many applications where it is important to raise an alarm if the instrument power supply is cut off. Normally energised coil operation allows for this application.

Alarm timer delays

Sets the minimum time that an alarm condition must be present to be recognised.

Setpoint security

You can change the setpoints from the front panel. If you want to disable this feature, switch on the setpoint security.

Alarm reset sequence

Alarms normally reset automatically when a trip condition has passed. Manual reset requires the operator to press the appropriate key before the alarm will clear. The alarm status LED flashes until the alarm is acknowledged and then remains on until the trip condition is gone.

Total or rate output and range

To set up the analogue outputs you must first choose if the output is going to be proportional to the rate or the total. After that you can set up the portion of the rate/total range that you want to retransmit.

Analogue output format

These setup parameters let the PTX800D show the output range correctly during review mode and prompt for the correct values during calibration. They have no affect on the operation of the instrument. If you change them you must be prepared to calibrate the outputs.

Output Action

Direct action results in the normal, proportional output. Reverse action gives an output that is inverted with respect to the rate, so a rate of zero gives a full scale output and vice versa.

Display Intensity

There are fourteen different levels.

• Setup Sequence

Setting	Display	Description	▼	▲	PGM
S/W Version	<i>uEr 1.01</i>	S/W Version 1.01	-	-	Next
Model	<i>PuLSE</i>	Pulse counter: PTX800D	-	-	Next
Inputs					
Input type	<i>IP =</i>	Introduces the input type	-		Next
	<i>LOdC</i>	Low level DC	Toggle		Accept
	<i>Hi dC</i>	High level DC			
	<i>LOdC</i>	Low level AC			
	<i>Hi dC</i>	High level AC			
	<i>Con</i>	Contact closure (debounced)			
Input pulse rate	<i>FREQ = LO</i>	Low frequency input (below 1 kHz)	Toggle		Accept
	<i>FREQ = HI</i>	High frequency input (from 1 to 10 kHz)			
Pulse scaling factor	<i>PuLSE dP = 12345</i>	Pulse scaling factor decimal point Demo display for decimal point selection	- Shift	- Shift	Next Accept
	<i>PuLSE SF = 1230</i>	Introduces the pulse scaling factor e.g., 1.230 Pulse = 1 Unit change in total	- Dec	- Inc	Next Accept

Setup Sequence (continued)

Total and rate display settings and scaling					
Total decimal point	<i>tot dP = 12345</i>	Introduces total decimal point Demo, e.g., total shown to one decimal place	- Shift	- Shift	Next Accept
Rate decimal point	<i>tot dP = 12345</i>	Introduces rate decimal point Demo, e.g., rate shown to 3 decimal places	- Shift	- Shift	Next Accept
Rate scaling factor	<i>rRate = SF = 1000</i>	Introduces rate scaling factor e.g., 1000 rate units = 1 total unit	- Dec	- Inc	Next Accept
Rate timebase	<i>rRate SEC</i> <i>rRate MIN</i> <i>rRate Hr</i>	Rate is in units per second Rate is in units per minute Rate is in units per hour	Toggle		Accept
Number of samples	<i>SAMP = 10</i>	Introduces the number of samples used for rate, e.g., 10	- Dec	- Inc	Next Accept
Show rate or total	<i>d, S = rRate</i> <i>d, S = tot</i>	Display normally shows the rate Display normally shows the total	Toggle		Accept
Reset key enable					
Reset Total Key Enable	<i>En rESY</i> <i>En rESn</i>	RESET key resets count RESET key ignored	Toggle		Accept
Alarm enable					
Alarms 1 & 2 Select	<i>A12Y</i> <i>A12n</i>	Enable Disable (Select this option for PMX420)	Toggle		Accept
Alarm channel one settings					
Coil energisation	<i>A1 nor E</i> <i>A1 nor d</i>	Normally energised Normally de-energised	Toggle		Accept
Alarm one type	<i>A1 = rRate</i> <i>A1 = tot</i>	Channel one monitors total Channel one monitors rate	Toggle		Accept
Alarm one action	<i>A1 = L0</i> <i>A1 = H1</i>	Low type (active below setpoint) High type (active above setpoint)	Toggle		Accept
Setpoint value	<i>SEt Pt = 50.00</i>	Setpoint value e.g., 50.00 %	- Dec	- Inc	Next Accept
Deadband value	<i>dbRNd = 0.01</i>	Deadband value e.g., 0.01 %	- Dec	- Inc	Next Accept
Timer delay	<i>dELAY = 20</i>	Timer delay (set to 0 s to disable) e.g., 20 s	- Dec	- Inc	Next Accept
Alarm channel two settings					
As above	As channel one (except uses <i>A2 nor E</i> , <i>A2 = rRate</i> , ..., <i>dELAY 2</i>)				

Setup Sequence (continued)

General alarm settings					
Setpoint security	SECURE Y! SECURE n	Setpoints fixed at setup Can change setpoints	Toggle		Accept
Alarm reset sequence	RES AUTO RES OPER	Automatic reset Manual reset	Toggle		Accept
Analogue output settings (not shown unless outputs are fitted)					
Rate or total output	OUT=RATE OUT= tot	Analogue output proportional to rate Analogue output proportional to total	Toggle		Accept
Rate range represented	RATE LO = 0.00	Introduces the rate low value e.g., 0.00	- Dec	- Inc	Next Accept
	RATE HI = 100.00	Introduces the rate high value e.g., 100.00	- Dec	- Inc	Next Accept
Total range represented	tot LO = 0.00	Introduces the rate low value e.g., 0.00	- Dec	- Inc	Next Accept
	tot HI = 100.00	Introduces the rate high value e.g., 100.00	- Dec	- Inc	Next Accept
Output type	OUT= Cur OUT= volt	Current (mA) output Voltage (V) output	Toggle		Accept
Output range	OUT LO = 4.00	Introduces output low value Value, e.g., 4.00 mA	- Dec	- Inc	Next Accept
	OUT HI = 20.00	Introduces output high value Value, e.g., 20.00 mA	- Dec	- Inc	Next Accept
Output Action	OUT dir OUT REV	Direct (proportional) output Reversed (inverted) output	Toggle		Accept
Calibration options					
Calibrate Output?	CALOUT n CALOUT y	Skip output calibration Calibrate outputs	Toggle		Accept
Display Intensity	INTENS = 23456789	Introduces the display intensity Demo display for adjustment	- Dec	- Inc	Next Accept
Save values	SAVE	Instrument is saving the changes to the setup and returning to normal operation			

Installation

Caution: In order to meet product safety requirements, these units must only be installed, by qualified staff, in accordance with the information given in this manual, using the mounting clips and terminal blocks supplied, and all relevant national electrical wiring and safety rules must be followed.

Locate the instrument in an area that is free from dust, moisture and corrosive gases (pollution degree II or better). Do not cover the ventilation holes at the side of the case.

Power Supply Requirements

PTX800A displays must be used with a suitable mains Power Supply, ratings are as follows:

Voltage Range	Nominal Voltage	Power	Frequency
100–132 V AC	110 V AC	6 VA	47–63 Hz
200–264 V AC	240 V AC	6 VA	47–63 Hz
21.6–26.4 V DC*	24 V DC	6 W (at 24 V DC)	-

*Using a DC power supply that provides this voltage will comply with the instrument's cULus listing, file number: E256486.

Input connections

The input circuit has programmable trigger levels according to the 'Input type' setting.

For NAMUR sensors, 3-wire NPN sensors, 3-wire PNP sensors, NPN open collector (O/C) outputs and PNP open collector (O/C) outputs set the input type to "High Level DC" (**H i d C**).

For voltfree contact inputs use 'Contact closure' (**C o n**). The minimum contact closure time is 20 mS and the maximum frequency is 10 Hz. For voltage pulses (including TTL/CMOS logic) select a suitable input type using the trigger/reset voltage table.

Input voltages over 45 V DC

If the input voltage is above 45 V DC connect the internal high voltage select jumper before applying the signal (maximum voltage is 250 V DC).

Digital pulse output

The basic model PTX800D has a retransmit pulse output, which gives a single pulse every time the total increases by one unit. The pulse width is a constant 32 ms and the minimum off time is 32 ms. The output is an isolated, NPN, open collector transistor type and can switch a maximum of 50 V DC or a current up to 200 mA.

Reset pulse input

Accepts a volt-free contact closure, or a shorting link, between pins 7 and 12. The contact must be closed for at least 100 ms.

Alarm channels one and two (optional)

Alarm channels one and two have SPDT relay contact outputs. The rated current decreases for inductive loads so using suppressor capacitors is recommended.

Analogue output (optional)

The analogue output provides you with a current or voltage based signal that is proportional to the rate or total. For rate outputs, the average value is the same as the rate, although the instantaneous value may differ slightly for rapidly changing signals.

Connections

For effective protection from electromagnetic noise, all signal cables must be shielded, or located on conductive trays or in conduits.

Strip wires to 7 mm from the ends. Use a suitable ferrule for multistranded wires (do not solder).

Pin	Signal	
1	Neutral / –	Power supply
2	Live / +	
3	Signal +	Analogue output (optional)
4	Signal –	
5	0V	Pulse output
6	Pulse	
7	Reset count	Short to 12 to reset
8	Security	Short to 12 for setup mode
9	Pull Up/Down	Inputs
10	Input – / 0V	
11	Input +	
12	+12 V DC (out)	
13	Normally Closed	Alarm one (optional)
14	Common	
15	Normally Open	
16	Normally Closed	Alarm two (optional)
17	Common	
18	Normally Open	

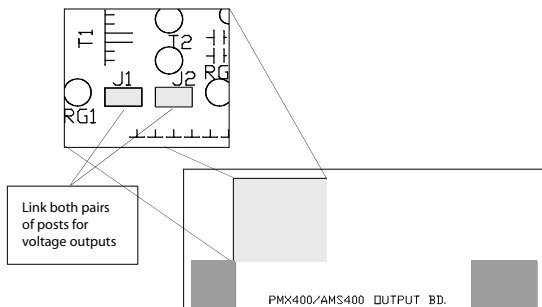
Input signals

The PTX800D input circuits are rated category II (suitable for measurements performed on the low voltage installation). They may safely be floating with respect to local ground (i.e., subject to common mode voltages) up to 250 V DC.

Symbols

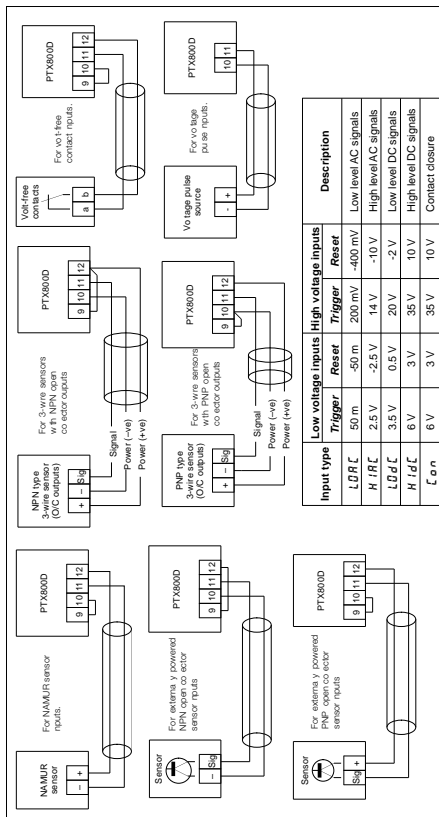
The instrument labels use symbols in accordance with IEC61010-1:

⚠ - Consult documentation; — — - Direct Current; □ - Double Insulated.



PTX800 analogue output board showing output type jumper locations.

Input Types



• Modifications

Analogue output type

The analogue output type (current/voltage) is set by internal push fit jumper. To change the output type:

Change the output type push fit jumper:

1. Gently remove the backplate (it is held in place by four lugs).
2. Slide the electronics from the housing.
3. Change the jumper location to the required setting (see diagram above).
4. Look inside the housing and note that there are connectors that mate with the display board.
5. Slide the electronics gently back into the case. Carefully moving the board until the keypad connectors engage with the display board.
6. Replace the backplate.

Change the output type in the software:

1. Power up the instrument and start the setup routine.
2. While the software version number is flashing, remove the security link and press **PGM**.
3. The display will show *Rout = 4*. Press **PGM**.
4. The display will show *Rout=volt* or *Rout= cur*. Select using up or down key.
5. Replace the security link and press **PGM**.

Change the output range settings:

6. Scroll through the setup and change the output type and range settings - you will be required to calibrate the outputs.

Calibrate the output:

7. Calibrate the outputs to the new output range and type.

High/Low voltage input selection

1. Gently remove the backplate (it is held in place by four lugs).
2. Slide the electronics from the housing.
3. Change the High/Low voltage jumper to the required setting (see diagram right).
4. Look inside the housing and note that there are connectors that mate with the display board.
5. Slide the electronics gently back into the case. Carefully moving the board until the keypad connectors engage with the display board.
6. Replace the backplate.

Output calibration

General

The PTX800D analogue outputs are calibrated for a specific output range and type. If you have changed the output range or type you must follow the procedure given below.

Allow the instrument 15 minutes of powered operation (to reach a stable temperature) before calibrating the output.

Equipment requirements

- An accurate digital multimeter (accurate to 0.05 mV and $\pm 0.1 \mu\text{A}$)

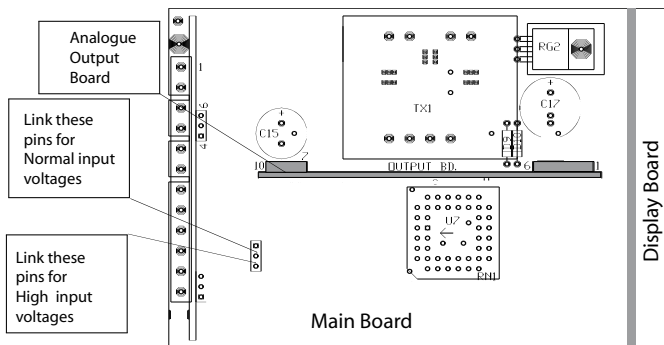
Terminal Connections for output calibration

Calibration Stage	Signal type	Terminal
Analogue Current Output	mA output +	3
	mA output –	4
Analogue Voltage Output	V output +	3
	V output –	4

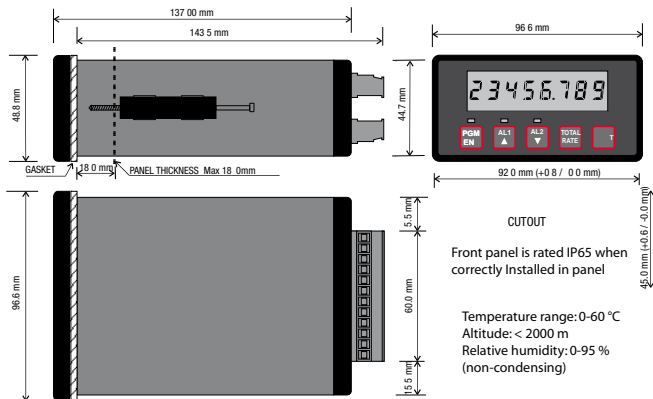
Procedure

Note: the procedure below shows calibration for the commonly used 4-20 mA format. If you have set the outputs to any other format, the unit will prompt you with the output high and low values you have chosen.

When the display shows	Action/Description
	Put the instrument in setup mode and scroll through the main menu
<i>CALOUT n</i>	Press ▲ or ▼
<i>CALOUT y</i>	Press PGM to select output calibration
<i>OUT LO =</i>	Connect the multimeter to measure the output level, then press PGM
<i>4.00</i>	Press PGM
	Measure the output signal
	Adjust the output (using the ▲ or ▼ keys) until the output is at the value shown
	When you are happy that the output is correct, press PGM
<i>OUT HI =</i>	Press PGM
<i>20.00</i>	Press PGM
	Measure the output signal
	Adjust the output (using the ▲ or ▼ keys) until the output is at the value shown
	When you are happy that the output is correct, press PGM
<i>SAVE</i>	Continue with the setup sequence.
Note: Do not remove the power while the save message is on display.	



Dimensions





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